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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,838	11/01/2006	Nynke A.M. Verhaegh	GB 030161	3699
24737 7590 07/17/2008 PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510				
EXAMINER				
TRA, TUYEN Q				
ART UNIT		PAPER NUMBER		
2873				
MAIL DATE		DELIVERY MODE		
07/17/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/572,838

**Applicant(s)**

VERHAEGH ET AL.

**Examiner**

TUYEN Q. TRA

**Art Unit**

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

**DETAILED ACTION**

***Oath/Declaration***

1. The declaration filed 11/01/2006 is acceptable.

***Drawings***

2. The drawings filed on 03/21/2006 in this application are accepted.

***Claim Objections***

3. Claims 8 and 24 are objected to because of the following informalities: Claims 8 and 24 recite "may be" which renders the claims unclear as to whether or not certain limitations following such indefinite language. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3 and 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Macks (U.S. Patent 3,773,684).

With respect to claim 1, Macks further discloses wherein at least one compartment for housing a particle suspension (Figure 15); means for applying a first electric field to the particle suspension (Figure 39, elements 106, 109), configured so that the first electric field has a first orientation (Y direction); and means (Figure 39, elements 106a, 109a) for applying a second electric field to the particle suspension (10, 10a, 10b, 10c), configured so that the second electric field has a second

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orientation (X direction) that is different from said first orientation (Figure 38-43, column 24, line 63 – column 27, line 64).

With respect to claim 2, Macks further discloses wherein the first and second orientations are mutually perpendicular (Figure 39, first orientation Y and second orientation X are perpendicular).

With respect to claim 3, Macks further discloses wherein a plurality of spacers (Figure 14, elements 99) for defining a plurality of compartments.

With respect to claim 13-16, Macks further discloses wherein the first and second electric fields is an AC field; wherein at least one of said first and second electric fields is a DC field; wherein at least one of said first and second electric fields is a homogeneous electric field; wherein at least one of said first and second electric fields is an inhomogeneous electric field(column 25, lines 30-32).

6. Claims 17, 18, 24-30 and 34-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson et al. (U.S. Pub. 2002/0167480A1).

With respect to claims 17, Johnson et al. further discloses wherein a transparent plate (figure 2, element 12); a substrate (figure 2, element 11); and a plurality of spacers (between substrate 11 and 12 and between each pixel); wherein the spacers define a plurality of pixels (paragraph [0031]).

With respect to claim 18, Johnson et al. further discloses wherein the pixels are compartments defined by the transparent plate (12), substrate (11) and spacers, the compartments being arranged to house a particle suspension (element 14) (paragraph [0035]).

With respect to claims 24-30, Johnson et al. further disclose wherein electric fields apply to a selected pixel (10) independently of at least one other pixel (10); first and second electric fields simultaneously applied to one or more pixels (10); transmittance and reflectance properties of a pixel (10) can be tuned to a grey value; configured to apply first and second electric fields to pixels (10) according to a driving scheme (Figure 1 and 2A-2D, paragraph [0027-0040]).

With respect to claim 34, Johnson et al. further disclose wherein tuning the transmittance and reflectance properties of at least one of a plurality of pixels in a suspended particle device (element 10), wherein said at least one pixel is tuned independently of at least one other pixel (paragraph [0035]).

With respect to claims 35 and 36, Johnson et al. further disclose wherein the plurality of pixels are discrete particle suspensions (Figure 3, element 13); wherein the plurality of pixels are regions within a compartment housing a particle suspension (element 13).

With respect to claim 37-40, Johnson et al. further disclose wherein applying one or more electric fields to one or more pixels; wherein a plurality of electric fields are applied simultaneously to the pixel; wherein a plurality of electric fields are applied to the pixel in turn, according to a driving scheme; resetting the suspended particle device (4, 27, 29, 31, 35, 39) by tuning at least one pixel, so that the transmittance and reflectance properties of the pixels are constant across the suspended particle device (figure 1 and 2A-2D, paragraph [0027-0040]).

7. Claims 31 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Macks (U.S. Patent 3,527,525).

With respect to claim 31, Macks discloses an applying to the particle suspension (element 29) a first electric field with a first field direction to control alignment of particles therein; and resetting the suspended particle device (20) by applying to the particle suspension (29) a second electric field with a second field direction that is different from the first field direction (column 3, line 70 – column 4, line 5).

With respect to claim 32, Macks further disclose wherein the suspended particle device (20) comprises a plurality of pixels in the form of separate particle suspensions and the first and second electric fields are applied only to one or more selected particle suspensions (column 4, line 68 – column 5, line 14).

8. Claims 31 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Comiskey et al. (U.S. Patent 6,724,519 B1).

With respect to claim 31, Macks discloses an applying to the particle suspension (element 29) a first electric field with a first field direction to control alignment of particles therein; and resetting the suspended particle device (20) by applying to the particle suspension (29) a second electric field with a second field direction that is different from the first field direction (column 3, line 70 – column 4, line 5).

With respect to claim 33, Macks further disclose wherein the suspended particle device (20) comprises a plurality of pixels in the form of regions of a particle suspension (element 50, 50').

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 4-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macks (U.S. Patent 3,773,684), as applied to claim 3 above, in view of Amundson et al. (US Pub. 20060038772).

With respect to claims 4-6, Macks further discloses wherein at least one compartment for housing a particle suspension (Figure 15); means for applying a first electric field to the particle suspension (Figure 39, elements 106, 109), configured so that the first electric field has a first orientation (Y direction); and means (Figure 39, elements 106a, 109a) for applying a second electric field to the particle suspension (10, 10a, 10b, 10c), configured so that the second electric field has a second orientation (X direction) that is different from said first orientation (Figure 38-43, column 24, line 63 – column 27, line 64). However, Macks does not disclose wherein the means for applying a second electric field to the particle suspension are provided within said spacers (36). Amundson et al. teaches the means (figure 9-11, element 926) for generating electric field to the particles suspension are provided within spacer (figures 9-11, element 922).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the optical apparatus such as disclosed by

Macks, and with a means for applying a second electric field to the particle suspension provided within spacer layer such as discloses by Amundson et al., for purpose of generating electric field in second direction.

With respect to claims 7-9, Amundson et al. further disclose wherein the means for applying a second electric field are arranged to apply an inhomogeneous electric field to the particle suspension (Figure 9, elements 908, 910); wherein electric fields apply to a selected particle suspension (figure 11, particles 908 or 910 are moving according to corresponding electric field) independently of at least one other particle suspension (908, 910).

With respect to claims 10-12, Macks discloses a compartment for housing a particle suspension (Figure 15); means for applying a first electric field to the particle suspension (Figure 39, elements 106, 109), configured so that the first electric field has a first orientation (Y direction); and means (Figure 39, elements 106a, 109a) for applying a second electric field to the particle suspension (10, 10a, 10b, 10c), configured so that the second electric field has a second orientation (X direction) that is different from said first orientation (Figure 38-43, column 24, line 63 – column 27, line 64). However, Macks does not disclose wherein first and second electric fields simultaneously applied to one or more particle suspensions; and in turn to particle suspensions according to a driving scheme. Amundson et al. teaches first and second electric fields simultaneously applied to particle suspensions (908, 910); configured to apply first and second electric fields in turn to particle suspensions (908, 910) according to a driving scheme (paragraph [0095-0097] and [0107]).



It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the optical apparatus such as disclosed by Macks, and with first and second electric fields simultaneously applied to particle suspensions; first and second electric fields applied in turn to particle suspensions according to a driving scheme such as discloses by Amundson et al., for purpose of generating electric field.

11. Claims 19-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (U.S. Patent 2002/0167480A1), as applied to claim 17 above, in view of Amundson et al. (US Pub. 20060038772).

With respect to claims 19, Johnson et al. further discloses wherein a transparent plate (figure 2, element 12); a substrate (figure 2, element 11); and a plurality of spacers (between substrate 11 and 12 and between each pixel); wherein the spacers define a plurality of pixels (paragraph [0031]). However, Johnson et al. does not disclose wherein the plurality of spacers comprise means for applying an electric field to a compartment. Within the same field of endeavor, Amundson et al. teaches the plurality of spacers (element 922) comprise means (element 926) for applying an electric field to a compartment (see figure 9).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the optical apparatus such as disclosed by Johnson et al., and with the plurality of spacers comprise means for applying an electric field to a compartment such as discloses by Amundson et al., for purpose of generating electric field.

With respect to claim 20, Amundson et al. further disclose wherein the pixels are defined by regions within a compartment arranged to house a particle suspension (908, 910) and said spacers comprise means (element 926) for simultaneously applying a first electric field with a given field direction to a first region and a second electric field with the same field direction to at least one other region.

With respect to claims 21-23 and 25, Amundson et al. further disclose wherein the means for applying an electric field are located within the spacers (36); wherein the means for applying an electric field are provided by the spacers (30); wherein the means for applying an electric field are located on the spacers (9, 32); wherein an active matrix (paragraph 0027, line 3) for addressing the pixels

### ***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Q. Tra whose telephone number is 571-272-2343. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky L. Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuyen Q Tra/

Examiner, Art Unit 2873

/HUNG X. DANG/

Primary Examiner, Art Unit 2873